

pipe, is disposed along the surface of the engine on the intake side. This makes it possible to dispose the branch intake pipe together with the electric supercharger around the engine in a compact manner

**[0085]** In the present invention, preferably, the main intake pipe may extend from the exhaust side of the engine toward the intake side of the engine upwardly toward the intercooler, and the first position may be located at a portion of the main intake pipe extending upwardly from the end of the engine in the cylinder array direction.

**[0086]** According to the aforementioned configuration, it is possible to branch the branch intake pipe relatively moderately from the main intake pipe, and to cause intake air to smoothly flow from the main intake pipe to the branch intake pipe.

**[0087]** In the present invention, preferably, the supercharging device may further include a first flow rate regulator valve which is disposed on the main intake pipe between the first position and the second position, and is configured to regulate a flow rate of intake air to be introduced to the intake ports through the main intake pipe.

**[0088]** According to the aforementioned configuration, it is possible to dispose the first flow rate regulator valve while securing a relatively large space between the first position and the second position.

**[0089]** In the present invention, preferably, the supercharging device may further include a second flow rate regulator valve which is disposed on the branch intake pipe at a position above the electric supercharger and below the intercooler, and is configured to regulate a flow rate of intake air to be introduced to the intake ports through the branch intake pipe.

**[0090]** According to the aforementioned configuration, it is possible to dispose the second flow rate regulator valve together with the electric supercharger around the engine in a compact manner by effectively using a space below the intercooler.

**[0091]** In the present invention, preferably, a lower surface of the intercooler may extend obliquely upwardly from an end of the intercooler on an intake manifold side toward an end of the intercooler on a side opposite to the intake manifold.

**[0092]** The aforementioned configuration is advantageous in securing a large space below the intercooler, and in facilitating mounting an electric supercharger or the like.

**[0093]** In the present invention, preferably, the engine may be a longitudinally mounted engine which is disposed in such a manner that the cylinder array direction is aligned with a vehicle front-rear direction, and the supercharging device may further include a partition wall which separates the inside of an engine room into a region where the engine and the supercharging device are disposed, and a region where a vehicle-mounted electrical component is disposed.

**[0094]** According to the aforementioned configuration, the inside of the engine room is separated into the region where the engine and the supercharging device are disposed, and the region where the vehicle-mounted electrical component is disposed by the partition wall. This makes it possible to prevent heat generated in the engine from adversely affecting the vehicle-mounted electrical component, and to promote a warm-up operation of the engine at the start of the engine by suppressing dissipation of heat generated in the engine.

**[0095]** This application is based on Japanese Patent Application No. 2016-024868 filed in Japan Patent Office on Feb. 12, 2016, the contents of which are hereby incorporated by reference.

**[0096]** Although the present invention has been fully described by way of example with reference to the accompanying drawings, it is to be understood that various changes and modifications will be apparent to those skilled in the art. Therefore, unless otherwise such changes and modifications depart from the scope of the present invention hereinafter defined, they should be construed as being included therein.

What is claimed is:

1. A supercharging device for an engine including a cylinder head with intake ports, comprising:

an electric supercharger which supercharges intake air to the engine;

an intercooler which cools intake air discharged from the electric supercharger; and

an intake manifold disposed substantially horizontally, and configured to communicate between a downstream end of the intercooler in an intake air flow direction, and the intake ports, wherein

the downstream end of the intercooler is located on a lower end of the intercooler, and the downstream end of the intercooler is disposed substantially at a same height as an upstream end of the intake ports, and

the electric supercharger is disposed below the intercooler along a surface of the engine on an intake side where the intake ports are opened.

2. The supercharging device for an engine according to claim 1, further comprising:

a turbocharger which is disposed along a surface of the engine on an exhaust side, and is configured to be driven by exhaust gas of the engine;

a main intake pipe which extends from a compressor of the turbocharger, extends from the exhaust side of the engine toward the intake side of the engine along an end of the engine in a cylinder array direction, and further extends toward the intercooler along the surface of the engine on the intake side; and

a branch intake pipe which is branched downward from a first position at a midway of the main intake pipe, passes the electric supercharger, and is disposed along the surface of the engine on the intake side, a downstream end of the branch intake pipe being connected to a second position of the main intake pipe on a downstream side than the first position.

3. The supercharging device for an engine according to claim 2, wherein

the main intake pipe extends from the exhaust side of the engine toward the intake side of the engine upwardly toward the intercooler, and

the first position is located at a portion of the main intake pipe extending upwardly from the end of the engine in the cylinder array direction.

4. The supercharging device for an engine according to claim 2, further comprising:

a first flow rate regulator valve which is disposed on the main intake pipe between the first position and the second position, and is configured to regulate a flow rate of intake air to be introduced to the intake ports through the main intake pipe.

5. The supercharging device for an engine according to claim 2, further comprising: